

What is claimed is:

1. A semiconductor fabrication system, comprising:
an air-tight housing in which an inert gas is admittable and exhaustible; and
5 a plurality of deposition chambers positioned within the system.
2. The system of claim 1, wherein one of the deposition chambers is a facing target sputtering.
- 10 3. The system of claim 2, wherein the deposition chamber further comprises:
a pair of target plates placed at opposite ends of said air-tight chamber
respectively so as to face each other and form a plasma region therebetween;
a pair of magnets respectively disposed adjacent to said target plates such that
magnet poles of different polarities face each other across said plasma region thereby to
15 establish a magnetic field of said plasma region between said target plates;
a substrate holder disposed adjacent to said plasma region, said substrate holder
adapted to hold a substrate on which an alloyed thin film is to be deposited; and
a back-bias power supply coupled to the substrate holder.

4. A facing targets sputtering device according to claim 3, wherein the back-bias power supply is a DC or an AC electric power source.
5. A facing targets sputtering device according to claim 1, further comprising a robot arm to move the wafer.
6. A facing targets sputtering device according to claim 1, further comprising a magnetron coupled to the chamber.
- 10 7. A facing targets sputtering device according to claim 1, further comprising a chuck heater mounted above the wafer.
8. The apparatus of claim 1, further comprising a rotary chuck to move a wafer.
- 15 8. The apparatus of claim 1, further comprising a linear motor to move the rotary chuck and sequentially expose the wafer to a plurality of chambers.
10. The apparatus of claim 1, wherein each chamber provides a collimated deposition pattern.

20

11. The apparatus of claim 1, wherein each chamber further comprises a door that opens during each chamber's deposition and closes when the chamber is not depositing.
12. The apparatus of claim 11, wherein each door comprises a baffle to catch falling
5 particulates.
13. The apparatus of claim 1, wherein the chambers share magnets.
14. The apparatus of claim 1, further comprising a housing pump to evacuate air from the
10 housing.
15. The apparatus of claim 1, wherein each chamber further comprises a chamber pump.
16. The apparatus of claim 1, further comprising chuck supported from underneath rather
15 than from the side.
17. The apparatus of claim 1, further comprising a jointed pendulum to support the wafer and keep the wafer at a constant vertical distance from the target as the pendulum swings.
- 20 18. A method for sputtering a thin film onto a substrate, comprising:

providing a plurality of deposition chambers, each having at least one target and a substrate having a film-forming surface portion and a back portion;

creating a magnetic field so that the film-forming surface portion is placed in the magnetic field with the magnetic field induced normal to the substrate surface portion

5 back-biasing the back portion of the substrate; and
sputtering material onto the film-forming surface portion.

19. A method as in claim 18, further comprising swinging the wafer using a pendulum.

10 20. A method as in claim 18, further comprising supporting a chuck from underneath rather than side-way.